mechanism was required because individual LEC productivity might experience variations around the industry factor.[108] At the same time, the Commission stated that it would employ the backstop until it had acquired additional experience with LEC price caps.

GTE suggests this fourth year review should provide enough information on LEC performance to satisfy the "additional experience" requirement. As will be discussed in the following section, Christensen Associates has performed an analysis of the LEC Total Factor Productivity ("TFP") and has derived a new productivity factor from the difference between LEC TFP and the overall economy TFP. This study includes LECs' performance for the years 1984-1992 and results in a productivity factor of 1.7 percent,[109] well below the current level of 2.8 percent (which does not include the consumer productivity dividend of 0.5 percent). Since the LEC productivity offset has declined, the Commission's fears that there might be wide swings in the factor should be quieted. Consequently, retaining sharing as a backstop mechanism for the future can no longer be justified.

Sharing also should be eliminated to finally sever the link to cost-based rate-of-return regulation. The incentives of rate-of-return regulation are antithetical to those of price caps. Under price caps, carriers are charged with greater risks and are provided

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[108] *LEC Price Cap Order*, 5 FCC Rcd at 6801.

[109] The LEC TFP grew at an average annual rate of 2.6 percent while the economy wide TFP growth had an average annual rate of 0.9 percent. Since the productivity factor in the price cap formula is based on the difference between LEC productivity growth and economy-wide productivity growth, the LEC TFP growth differential is 1.7 (2.6 minus .9)

incentives to attain a certain level of productivity or higher. If they attain this through cost savings or improved sales, they should be permitted to retain the reward. If there is an artificial ceiling on earnings, then the incentive to behave efficiently and to innovate is severely weakened. The Commission recognized this flaw when it stated that "[a] backstop mechanism may dampen the LECs' risks and rewards and thus reduce the incentives of a 'pure' price cap plan."[110] This point was further recognized by Commissioner Barrett in his separate statement associated with the Notice when he recommended "reducing the Commission's link between prices and earnings on rate base."[111] Sharing also shifts risk from the LEC to the consumer -- just the opposite of the Commission's original intent.[112]

The elimination of sharing is critical to the Commission's ability to deal with a mixed environment where some markets are more competitive than others. In that environment, the elimination of sharing will strengthen the protection that price caps provide customers in less competitive markets. It will do this by severing the link between the cap on less competitive prices and a LEC's performance in more competitive markets. It ensures that the prices of less competitive services will be unaffected, regardless of whether the LEC succeeds or fails with its more competitive services.

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110 *LEC Price Cap Order*, 5 FCC Rcd at 6801.

111 NPRM, Separate Statement of Commissioner Andrew Barrett RE: Price Cap Performance Review for Local Exchange Carriers.

112 *See*, Dr. Schankerman's discussion at 27.

An unregulated firm, operating in a competitive market, would set the price of each of its services at its profit-maximizing level. The limit on each price is given by market supply and demand. If the firm reduces the price of service A, it can not make up the difference by raising the price of service B. The price of B already is set at the best level; raising it would actually **reduce** profits. This is true even if service A faces more intense competition than service B. Similarly, if service A does not sell as well as expected, it would not do the firm any good to "allocate" any more cost to service B. Again, any change in the price of B would not benefit the firm. Therefore, in a competitive market, market pressure protects the customers for each service independently, and there is no link between their prices.

However, in the artificial world of rate-of-return regulation, a link is established among all the services included in the firm's revenue requirement. In a traditional rate-of-return system, the firm is presumed to have market power. The constraint on service prices comes from the regulatory limit on the firm's earnings. This is supposed to serve as a substitute for the market pressure that limits the prices of the competitive firm. But unlike market pressure, the rate-of-return constraints are not independent across services. If the firm reduces the price of service A, it creates "room" to raise the price of B and still remain within the rate-of-return constraint. Similarly, if the demand for A falls, the firm's earnings fall – allowing an increase in the price of B.

The ability to raise the price of one service because of a change in another service is an artifact of rate-of-return regulation.[113] It would not exist for a competitive firm or a firm under price caps. Price cap regulation provides a means of protecting customers against possible abuse of market power, where necessary, without creating this artificial link across services. Therefore, price cap regulation more closely approximates the workings of a competitive market. Like the competitive firm, the firm under price caps cannot make up a shortfall in one service by raising prices on another service. This property makes price caps better suited to a mixed, transitional environment where some markets are more competitive than others.

When sharing is added to price cap regulation, it reintroduces the shortcomings of rate-of-return, including the artificial link across services. If a firm under sharing reduces prices in more competitive markets, or simply loses business in those markets, it may depress its earnings sufficiently to activate the low-end adjustment mechanism. This, in turn, would give the firm the ability to raise prices in less competitive markets. By eliminating sharing, the Commission can break this linkage. This will ensure that consumers in less competitive markets will be protected by price caps, and that these

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[113] *See, Schmalensee/Taylor* at n.23. Within rate-of-return regulation, cost allocation schemes are often used to deal with this problem. But the Commission has already recognized that cost allocations are not effective at replicating either the incentives for firms or the relative rate relationships that a competitive market would produce. *See AT&T Price Cap Order*, 5 FCC Rcd at 6791. Cost allocation schemes do not sever the artificial rate-of-return link across markets or services. For example, if the demand for service A falls because of competition in the market for A, most cost allocation schemes will shift cost from A to the less competitive service B.

caps will be unaffected by changes in price or demand in the more competitive markets.[114]

The Notice (at paragraph 97) recognizes the need to establish a mechanism to deal with the fact that some access markets are more competitive than others, and to accommodate the further development of competition. It contemplates some form of trigger mechanism that would lead to streamlining regulation where competition is greatest. The elimination of sharing is an essential element of any such framework, because it is necessary to ensure that the caps in markets which have not yet reached the trigger point will not be affected by events in those markets that have been streamlined.

Finally, sharing has adversely affected Commission decisions in matters outside this proceeding. As mentioned *supra*, the sharing mechanism became a rationale cited in support of not only retaining costly and burdensome requirements concerning depreciation and cost allocation, but indeed in support of imposing still more burdensome requirements.[115]

In summary: Because the stated rationale for a sharing mechanism has been eliminated, sharing should be eliminated. The LECs' realized productivity provides no

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[114] As the Notice (at paragraph 97) recognizes, the baskets and bands of a price cap plan must be properly designed to separate more competitive rate elements from less competitive ones. As discussed *supra*, GTE's proposal does this. However, this does not require any cost allocation mechanism.

[115] Simplification of the Depreciation Prescription Process, CC Docket No. 92-296, Report and Order, FCC 93-452 (released October 20, 1993) at paragraphs 20 and n.28 and at paragraph 44; Amendment of Parts 32 and 64, CC Docket No. 93-251, Notice of Proposed Rulemaking, FCC 93-453 (released October 20, 1993) at paragraph 103.

support for sharing as a backstop mechanism. Further, sharing perpetuates an undesirable link to rate-of-return regulation that must be removed for the benefits of price caps to be fully realized. The elimination of sharing is critical to the Commission's ability to deal with a mixed environment where some markets are more competitive than others. In that environment, the elimination of sharing will strengthen the protection that price caps provide customers in less competitive markets.

7. Any LEC productivity factor should be based on a long-term Total Factor Productivity analysis of the telecommunications industry. *(Baseline Issues 3a & c)*

Because GTE believes that any productivity offset should continue to be an offset for the entire telecommunications industry, GTE supports USTA's Comments in the instant proceeding. USTA has attached to its pleading two documents[116] that provide information on the LEC productivity offset and the TFP. GTE supports the conclusion reached by both Christensen Associates and NERA that the LEC productivity offset is approximately 1.7 percent. The TFP approach incorporates the effects on overall productivity of all the productive inputs, and not just one or two, such as labor productivity. TFP must also be long-term in nature to remove any short term fluctuations.

The productivity offset should be lowered for two reasons.

First, the detailed Christensen study has produced an estimate of 1.7 percent.

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[116] *See*, Christensen Associates, *Productivity of the Local Operating Telephone Companies Subject to Price Cap Regulation*, and National Economic Research Associates, Inc., *Economic Performance of the LEC Price Cap Plan*, attachments to USTA's Comments in this proceeding.

Second, the Commission, in the cable cost-of-service proceeding, recently proposed to adopt a 2.0 percent productivity offset for not only a potential competitor of the LECs but a similarly situated industry, the cable industry.[117] This number was based upon evidence submitted by the staff of the New Jersey Board of Regulatory Commissioners and was the only cable-specific value submitted to the Commission. The Commission earlier concluded that the cable industry should "reasonably be expected to achieve productivity gains in the future analogous to those historically realized by other communications firms."[118] Regulatory symmetry dictates that these two telecommunications industries, which both operate under price cap plans, should have similar productivity offsets.

The Commission asks (at paragraph 46) whether it should adopt a mechanism to adjust the price cap plan to reflect changes in interest rates. GTE, in support of USTA, opposes any adjustment for interest rates. The effect of changes in interest rates is reflected in the Gross National Product-Price Index ("GNP-PI") which captures overall changes in the cost of doing business. Specifically, the Commission found that the GNP-PI is a "very broad-based price index that measures changes in all costs -- including tax costs -- that affect prices in the economy...." and that exogenous treatment of these changes would result in double-counting.[119] On this basis, the

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[117] Implementation of Sections of the Cable Television Consumer Protection Act of 1992: Rate Regulation and Adoption of a uniform Accounting System for Provision of Regulated Cable Service, MM Docket No. 93-215 ("*D.93-215*") and CS Docket No. 94-28, (Released March 30, 1994,) at paragraph 320.

[118] *D.93-215*, Report and Order and Further Notice of Proposed Rulemaking, FCC 94-39 (released March 30, 1994) at paragraph 319.

[119] *LEC Price Cap Order*, 5 FCC Rcd at 6808.

Commission declared tax rate changes endogenous. Interest rates are similar in this respect to corporate tax rate changes. LECs do not control either interest rates or tax rates, but they are considered normal risks of doing business. Consequently, since interest rates are reflected in the GNP-PI and are similar in nature to tax rate changes, they should be treated endogenously and no adjustment mechanism is required or appropriate.

In summary: Two very competent firms' TFP analyses indicate 1.7 percent is the appropriate price cap productivity offset for LECs. In addition, the Commission chose a productivity offset of 2.0 percent for another similarly situated and competing telecommunications industry, the cable industry. The productivity factor must be adjusted downward to reflect realistic productivity gains that the LECs can maintain over time. Further, It would not be appropriate to create an adjustment mechanism for interest rates inasmuch as interest rate changes are reflected in price caps through the GNP-PI and are similar in this respect to tax rate changes, which are treated endogenously.

8. The Balanced "50/50" common line formula should be eliminated if a long-term Total Factor Productivity adjustment is selected. (*Baseline Issue 5*)

When it adopted incentive regulation, the Commission incorporated an adjustment to the common line formula to reflect the difference between the growth rates of lines and minutes. This adjustment was referred to as the balanced "50/50" formula. Given the additional information on productivity for the LEC industry which is now available to the Commission, it is neither necessary nor appropriate to retain the common line price cap formula adjustment.

As GTE explains *supra*, the relevant measure on which to base the productivity factor is TFP. This measure includes all inputs and outputs to the production process. It therefore captures all of the changes in LEC productivity over time, regardless of whether one believes that LEC costs are driven by changes in minutes, lines, or any other output.

The Commission adopted the "50/50" formula out of a concern that exchange carriers would realize gains in productivity when demand denominated in minutes increased more rapidly than common line costs, which were presumed to increase with the number of lines. It was also argued that growth in minute demand was affected by the efforts of interexchange carriers rather than those of exchange carriers. Two points are relevant to these concerns:

First, by setting the productivity factor on the basis of total factor productivity or TFP, the Commission will capture, and pass on to consumers, any benefits the LECs can be expected to gain from growth in demand, based on the productivity experience of the recent past. No further adjustment is necessary. On the contrary, continued application of the "50/50" formula would double-count effects which have already been captured in the productivity offset.

LEC networks are characterized by economies of scale. For this reason, whenever an exchange carrier can carry more units of demand on its network, it will realize a gain in productivity. But this affects all LEC services, not just common line. If an exchange carrier can handle more local switching minutes through its offices, it will reduce its average cost of switching, and improve its productivity. If demand on a transport route increases, the unit cost of carrying that traffic will decline. Christensen's analysis demonstrates the effect of changes in demand growth on productivity.

Similarly, since most access is sold as an intermediate good, the growth of access demand may depend, in part, on the efforts of IXCs to promote end-user demand for the final service. In this respect, however, common line service is not different from most other access services. But the effect of that growth in demand will be captured by the estimate of total factor productivity. This is true regardless of which access service experienced the growth, and regardless of which carrier's efforts caused the growth.

Second, when the Commission seeks to capture, *ex post*, specific factors which contribute to productivity growth, it violates the fundamental principles underlying the design of its incentive regulation plan. The aggregate productivity offset represents the sum of many factors which influence LEC productivity. This offset is determined prospectively, not trued up after the fact. The purpose of the price cap plan is not to identify, and manage, every potential source of productivity, but rather to establish a system of incentives at an aggregate level that will induce the firm to discover sources of productivity. The productivity offset based on TFP serves that function in the price cap plan.

In summary: A productivity offset based on total factor productivity or TFP will fully capture any improvements in LEC productivity attributable to growth in common line demand, just as it captures all other sources of productivity growth. Any further adjustment to account for differences in growth between lines and minutes would inappropriately double-count effects already captured in the productivity offset. The common line formula adjustment should not be retained on either a minute-of-use or per line basis.

9. Exogenous cost treatment should be retained. (*Baseline Issue 6*)

The Commission states (at paragraph 64) that it believes it should "reduce the categories of cost changes eligible for exogenous treatment where this will improve [the] price cap efficiency incentives."

GTE suggests the governing principle is: Costs not reflected in the GNP-PI should be treated as exogenous. Further, exogenous cost treatment must be retained for the LECs as long as it remains an integral part of both AT&T's and the cable industry's price cap plans. Symmetry between plans is essential as these industries continue to converge.

If the Commission decides to reexamine exogenous cost treatment, it should pay particular attention to regulatory and legislative actions that require the LECs to make uneconomic investments, *e.g.*, investments in the network that do not produce revenues to offset the costs or associated reductions in expenses. Exogenous treatment must be retained for changes of this type. It would be unfair to the LEC and its stockholders to require them to absorb the costs of uneconomic investments mandated by regulatory or legislative action.

In summary: Exogenous cost treatment has a definite place in the price cap formula. LECs should be allowed to treat costs outside their control and not in the GNP-PI as exogenous. The LECs should not be required to absorb costs mandated by regulatory or legislative action that requires them to make uneconomic investments. The Commission should exercise caution in changing the rules for exogenous cost treatment.

10. Service quality reporting and infrastructure monitoring should be maintained at the existing levels. *(Baseline Issue 7 and Transitional Issue 4)*

When the Commission established incentive regulation for LECs, it concluded that both service quality and investment in the infrastructure must be monitored to determine: (1) if the incentives in the plan were working; and (2) whether the LECs sacrificed service quality and infrastructure investments in order to obtain more favorable results.[120]

Incentive regulation has not adversely affected LECs' service quality or infrastructure investment. As the Notice recognizes (at paragraph 27): "Service quality monitoring data indicate that service quality under price caps has been similar to levels under rate-of-return regulation."

If anything, it would be appropriate to reduce the level of service quality monitoring in the future. As access markets become more competitive, asymmetric reporting requirements for LECs will unfairly burden them relative to competing firms. The Commission should determine what minimum level of reporting is needed, and then require that same reporting from all market participants.

In summary: GTE believes that the existing level of monitoring is more than adequate and that any increase would unreasonably burden exchange carriers relative to other providers. There is no indication that the LECs have let service quality or infrastructure investment diminish. Additional monitoring is unnecessary. As markets

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[120] *LEC Price Cap Order*, 5 FCC Rcd at 6827.

become more competitive, the Commission should establish symmetrical reporting requirements for all carriers.

11. Existing rules for sales and exchanges of LEC properties are adequate. *(Baseline Issue 10)*

The existing Commission rules for the sale and exchange of properties between price cap LECs and between a price cap LEC and a non-price cap LEC have served the Commission, the LECs, and the LECs' customers adequately. Because of the unique nature of specific purchases, sales, mergers or other acquisition activity, each should be reviewed on a case-by-case basis.

The Notice already has determined (at paragraph 88) that these transactions can "improve service efficiency and quality" and "promote better infrastructure development." The Commission should not thwart achievement of these objectives by imposing unnecessary or burdensome regulation.

In summary: The rules in place for the sale or exchange of LEC properties have served the Commission and the LECs as they were designed. The Commission should not make any changes.

12. The frequency of review should be linked to the type of plan adopted by the Commission. *(Baseline Issue 11 and Transitional Issue 5)*

The primary objective of this Notice should be to develop a regulatory plan that will be sufficiently flexible to encompass an increasingly competitive interstate access

market. If designed properly, a price cap plan would not need to be reviewed for seven to ten years.[121] As Dr. Schankerman states (at 26-27):

> Clear and stable rules of competition are needed for a period that corresponds, at a minimum, to the economic life span of capital equipment embodying new technology, and the time needed to develop and market new services and to realize the benefits of other productivity improving activities. This is necessary to enhance the credibility of regulatory commitment, to facilitate rational investment and other long range planning by LECs and competing providers, and to allow the efficiency incentives to work. Frequent price cap reviews would undermine all these objectives.

In fact, if a price cap plan is reviewed too frequently the incentives are diminished and the plan becomes only be a slight improvement over rate-of-return regulation. A plan, left untouched – with proper incentives including pricing flexibility, no sharing, and a reasonable productivity offset – will promote and achieve the Commission's goals as set forth in this Notice.

In summary: If the Commission designs a price cap plan that includes pricing flexibility, eliminates sharing, and establishes a realistic productivity offset, the plan would not need to be reviewed for at least seven to ten years.

V. PRICE CAP REGULATION IS CONSISTENT WITH ACHIEVEMENT OF UNIVERSAL SERVICE OBJECTIVES. (Baseline Issue 1b)

GTE agrees with the Commission that maintaining universal service in an increasingly competitive market should be an important objective of Commission policy. The Commission seeks comment (at 36) as to whether the goal of providing universal

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[121] *See*, Strategic Policy Research ("SPR"), ***Regulatory Reform for the Information Age***, January 11, 1994, at 3-20. SPR also recommends a review period of eight to ten years. *Id.* at 20.

service is being met, and whether the price cap plan should be modified to better achieve this goal.

As the Notice observes (at paragraph 29), the percentage of households subscribing to telephone service has increased over the review period from 93.3 percent to 94.2 percent. The Commission notes that penetration levels are substantially lower for households where the head of household is African-American or Hispanic. However, it is clear from the Commission's tracking data that telephone subscribership has increased during the period more rapidly for these groups than for the population as a whole. The percentage of African-American households subscribing has increased from 83.5 percent to 85.2 percent, while the percentage of Hispanic households subscribing has increased from 82.7 percent to 86.7 percent.[122]

An interstate price cap plan which provides a sound environment for effective competition and efficient investment in the infrastructure can contribute to the Commission's success in maintaining universal service. If exchange carriers are able to compete effectively in interstate access markets, they will be better positioned to fulfill their universal service obligations. If a reformed price cap plan promotes efficient

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[122] Industry Analysis Division, Common Carrier Bureau, *Telephone Subscribership in the United States*, March 1994 at 6.

investment in the infrastructure, it will make advanced network capabilities available to a wider cross-section of Americans.[123]

However, customers' decisions to subscribe depend on a host of factors. To the extent that they are a function of telecommunications rates, they are more directly related to local rates than to interstate access rates.[124] In California, GTE and Pacific Bell have sponsored a Telephone Affordability Study which is one of the most intensive studies yet performed of customers' decision to subscribe.[125] The results of this work suggest a number of factors which influence the subscription decision, including 1) A lack of awareness of the programs currently in place to make service more affordable; 2) need for better options for controlling toll usage; 3) Confusion regarding the criteria to qualify for universal service programs, especially among African-American, Hispanic, Chinese, Korean, and Vietnamese customers; and 4) The mobility of customers.[126]

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[123] *See*, Attachment 8 to USTA's comments in this proceeding, in which Lawrence K. Vanston estimates the effects of price cap reform on the widespread deployment of advanced network capabilities. However, the FCC cannot effectively promote widespread availability simply by requiring LECs to offer new services under tariff in all areas. (Baseline Issue 8c.) Such a requirement would have the opposite effect: It would create an uneconomic barrier that would deter companies from proposing new services. Market forces should be permitted to determine the rate at which new services are adopted, and the geographic extent of their availability. If, as a matter of universal service policy, the FCC wishes to ensure more widespread deployment of a particular service than the market would dictate, then this extension should be funded through an explicit universal service program.

[124] Interstate access rates may have a small, indirect effect on subscription, to the extent that they affect long distance rates, and to the extent that control of toll bills is one of the reasons customers choose not to subscribe.

[125] Field Research Corporation, *Affordability of Telephone Service* (1993).

[126] Non-subscribers were twice as likely to have been at the same address for less than one year than subscribers (52 percent vs. 27 percent). Installation charges were seen as an obstacle to subscription by these customers.

USTA's Petition asks the Commission to open a proceeding to conduct a comprehensive examination of universal service issues. GTE strongly supports this request, and believes that such a proceeding would be an appropriate forum for addressing the universal service concerns raised in the Notice.

In summary: Price cap reform can contribute to universal service by encouraging network investment which will make advanced services more widely available. The determinants of local telephone subscription are many and varied. GTE supports USTA's call for a new proceeding to conduct a broad–based examination of universal service issues.

Respectfully submitted,

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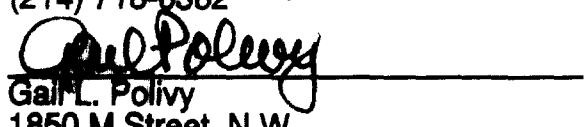

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ATTACHMENT A

Regulatory Reform for Local Exchange Carriers: Competition through Regulatory Symmetry

Statement of Dr. Mark Schankerman
London School of Economics

Regulatory Reform for Local Exchange Carriers: Competition through Regulatory Symmetry

Statement of Dr Mark Schankerman
London School of Economics

The Federal Communications Commission is at a critical juncture in telecommunications regulation. Four years ago the Commission introduced price cap regulation for local exchange carriers. This marked a major improvement over traditional cost of service regulation because it streamlined regulatory procedures and introduced incentives for efficient firm behaviour in place of regulatory micromanagement. However, technological developments and the associated rapid growth of competition have outgrown the existing regulatory framework. The Commission needs urgently to fashion a more comprehensive regulatory reform that will enable the full social gains from these developments to be realised. To accomplish this, price cap reform must be based on a longer range vision of market competition in provision of facilities and services, and must be designed to promote development and efficient utilisation of a modern and flexible telecommunications infrastructure at minimum cost. Above all else, this requires that the regulatory framework supports the market in providing appropriate price signals to induce efficient investment in this infrastructure.

In the Notice of Proposed Rulemaking,[1] the Commission took the important step of extending the price cap review to encompass regulatory reform for the "transition" to competition. This paper reviews important principles that should guide this wider reform effort. The central recommendation in the paper is that the Commission should base reform on the principle of regulatory symmetry, and that deviations from symmetry should be adopted only in special cases that meet two conditions: (i) there is a demonstrated

[1] See Price Cap Performance Review for Local Exchange Carriers, Notice of Proposed Rulemaking (NPRM), CC Docket No. 94-1, FCC 94-10, released February 16, 1994.

ability of incumbents to deter entry strategically (i.e. in ways that do not reflect their relative efficiency levels) and (ii) there is no less costly way to redress the imbalance.

Section 1 discusses the importance of adopting regulatory symmetry as the benchmark for regulatory reform, with focus on socially inefficient (uneconomic) entry and the associated technical efficiency losses. Section 2 discusses possible strategies to deter entry and analyses whether they warrant countervailing asymmetric regulatory treatment. The focus is on the design of regulatory instruments that minimise technical efficiency losses. Section 3 argues that the regulatory framework for transition to full competition should be tackled at this time, and not postponed until competitive incursion expands. Section 4 develops principles for price cap reform from the perspective of regulatory symmetry. Section 5 briefly discusses the design of mechanisms to fund universal service obligations which are consistent with regulatory symmetry. Section 6 and 7 briefly review two technical issues in the baseline price cap - the productivity offset, and the mechanisms for sharing and low-end adjustment.

1. **The Importance of Symmetric Regulation**

In general terms symmetric regulation means providing all suppliers, incumbents and new entrants alike, a level playing field on which to compete - the same price signals, restrictions, and obligations. Full symmetry must encompass all stages of market participation: entry, post-entry competition, and exit. The most important regulations are those which restrict or raise the cost of entry into new geographic areas and new product markets (introduction of new services), pricing flexibility, and the funding of universal service obligations. Regulatory symmetry should apply both to competition **within** traditional local exchange markets, and **between** the local exchange and other markets which are linked by high cross elasticity of supply, such as cable television. The principle is equally relevant to cases where local exchange carriers (LECs) are incumbents and where they are potential entrants. The technological convergence between local exchange and these other markets, such as Personal Communications Services (PCS) and cable television, requires an integrated and symmetric regulatory framework. The Commission

developed rules for cable regulation under specific and urgent Congressional mandate, independent of the present LEC price cap review. There needs to be a much more co-ordinated approach to develop an integrated policy toward local exchange and cable regulation.

The basic economic rationale for regulatory symmetry is to maximise technical efficiency. Strictly speaking, technical efficiency refers to production of a given set of services at the minimum feasible cost.[2] Throughout this discussion, I use the term "technical efficiency" in the broader sense to encompass other important dimensions of economic performance, such as effectiveness in satisfying specialised and evolving customer needs, selection of appropriate technologies, development and commercialisation of new services, and service quality. Technical efficiency in this broader sense must be a central regulatory objective. Otherwise, very substantial social resources will be wasted in the design, construction, and continued development of the information infrastructure.

The plain fact is that some firms are more "efficient" than others, but there is very imperfect information about this heterogeneity. Firms differ in their unit production cost, service quality, choice of technology, mix of services, managerial capacity, and a host of other variables that determine their current "efficiency" level and their adaptability to evolving technology and demand. The regulator cannot distinguish between more and less efficient suppliers, and must therefore not be in the position of "picking winners" either at the stage of entry or post-entry competition. **But all forms of asymmetric regulation contain an intrinsic bias toward some firms or technologies and therefore create the potential for very large technical efficiency losses.** In principle this holds both for regulations that favour incumbents and entrants.

Once uneconomic entry is induced by asymmetric regulation, it creates political constituencies that make subsequent reform more difficult. This is especially true if the

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[2] Technical efficiency losses are called "first order" losses because the elevated production cost applies to all units of output. Allocative efficiency refers to prices that reflect the marginal resource cost of supplying the good. Allocative distortions (e.g., monopoly pricing) are of "second order" importance because they induce loss of consumer and producer surplus only on the marginal units of output.

original investment costs were sunk. Furthermore, the technology used by entrants may induce large users and secondary suppliers to make complementary, sunk investments. Examples include the purchase of CPE equipment (especially PBX) to provide the LEC end office switching function, installation of fiber cable and terminals to link end user facilities and the interexchange carrier office, and human capital investments in the design, purchase and management of the customer's network. To the extent that these downstream, complementary investments are idiosyncratic (dedicated), they represent additional technical efficiency losses associated with the original uneconomic entry.[3] Moreover, they extend the constituency interested in the maintenance of the status quo, and intensify the political pressure to preserve existing competitors rather than the competitive process. These dynamic costs of maintaining regulatory asymmetry should not be underestimated.

These are compelling reasons to establish symmetric regulation. Therefore, the central recommendation in this paper is that **regulatory symmetry** should be the benchmark for regulatory reform. The Commission should only apply asymmetric treatment of incumbent LECs and competing facility or service providers if two conditions are satisfied. First, there must be a demonstrated capacity of an incumbent LEC strategically to deter entry (i.e., not related to efficiency advantage), since otherwise competition will generate a technically efficient outcome and no intervention is warranted. This condition is not sufficient, however, because there may be regulatory mechanisms that can redress the imbalance effectively without introducing asymmetric treatment and its associated economic costs. The second requirement is that asymmetric regulatory treatment must be the least costly way to resolve the potential problem. The next section discusses potential entry deterrence strategies and argues that they can be effectively redressed without resorting to asymmetric regulation.

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[3] Uneconomic entry can also induce subsequent "localised technical change" directed at improving the technology used by the entrant. If the original choice of technology was distorted by asymmetric regulation, these resources are misdirected and represent additional social costs.

2. **Strategic Entry Deterrence and Symmetric Regulation**

This section analyses four practices with the potential to induce exit or deter entry: (i) preemptive investment, (ii) vertical price squeeze, (iii) predatory pricing, and (iv) cross subsidisation. In each case two issues must be addressed: first whether these practices are likely to deter entry effectively, and second whether asymmetric regulation is the appropriate policy response.

Preemptive Investment refers to a strategy where entry by one firm makes subsequent entry by others unprofitable and thereby forecloses the market.[4] Effective preemption requires a number of preconditions. The first condition is that there must be an indivisible sunk entry cost (threshold scale). Sunk investment is required to make the entry commitment credible. The indivisibility is needed because otherwise there could be subsequent entry at lower scale (smaller sunk cost) and preemption would fail. The second condition is that the market must be too small to support more than one incumbent profitably at the threshold scale. Thus, the preemption hypothesis fits rather uncomfortably with the basic presumption underlying regulatory reform by the Commission that markets can sustain multiple suppliers ("network of networks"). The third condition applies to multiproduct incumbents: there must be a sunk cost to exit. To understand why, suppose the incumbent could withdraw from a product market (say the first) without incurring an exit cost. Entry by a second firm into that market will create price competition that reduces prices and profits for the incumbent. But the fall in price will reduce prices and profits of any substitutes supplied by the incumbent. It can be more profitable for the incumbent to withdraw from the first market in the face of new entry in order to avoid this cross-market price effect. In this case preemptive investment is not a credible strategy and will fail to deter entry.[5]

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[4] Models of preemption are analysed in sequential, or dynamic, games. Preemption has been studied in various contexts including patent races, product proliferation, and capacity investment. For a theoretical discussion of preemption, see Jean Tirole, The Theory of Industrial Organisation (Cambridge: MIT Press, 1989), especially Chapter 8.

[5] Preemptive investment will be less effective when the exit costs are smaller, the price competition between incumbent and the new entrant is more intense, and the incumbent's

In addition to these conditions, preemption is more difficult where the incumbent does not possess the entrant's (superior) technology or has incomplete information about the entrant's characteristics (See Jean Tirole, op.cit., 350-352). In short, markets characterised by evolving and diverse demands and technologies and large uncertainty are less likely candidates for preemption, other things equal.

These conditions suggest that the scope for effective preemption in the current telecommunications market is limited. Preemption in services is especially unlikely to be successful, and does not pose a serious regulatory challenge. There may be some limited potential for preemptive investment in facilities in particularly small markets. It is important to emphasise, however, that the opportunity for preemptive investment is not limited to incumbent firms. An alert new entrant may fill a market niche, or provide superior technology for provision of existing services, and thereby foreclose profitable operation by the incumbent. In any event, the rapid expansion of fiber networks by cable companies and other providers casts serious doubt on the practical relevance of preemptive investment by incumbent LECs.[6]

In theory, it may appear that regulation could prevent preemption directly by imposing restrictions on incumbent investment, or indirectly by constraining pricing flexibility which would reduce the incentive to invest.[7] But how could a regulator distinguish in

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different products are closer substitutes. This argument is developed formally in Kenneth Judd, "Credible Spatial Preemption," Rand Journal of Economics (Summer 1985), 153-166.

[6] For extensive evidence of investment by cable companies and other competitive providers in fiber networks and other transport technologies, see Peter Huber, "The Enduring Myth of the Local Bottleneck," (March 14, 1994).

[7] The most important direct restrictions are the telephone company/cable television cross ownership rules and the investment approval procedures under Section 214 of the Communications Act. The Commission has authorised telephone companies to offer a basic platform for video dialtone (VDT) service within their operating territories (Telephone Company/Cable Television Cross Ownership Rules, Section 63.54-63.58, CC Docket No. 87-266, Second Report and Order, Recommendation to Congress, and Second Further Notice of Proposed Rulemaking, 7 FCC Rcd 5781 (1992)), but it has not yet approved any applications for a tariffed VDT service on a non-experimental basis. Companies with pending applications include New Jersey Bell, U S West, Rochester Telephone, Pacific Bell, and the Chesapeake & Potomac Telephone Companies of Maryland and Virginia.